

## ***Interactive comment on “Nanoparticles in boreal forest and coastal environment: a comparison of observations and implications of the nucleation mechanism” by K. Lehtipalo et al.***

**Anonymous Referee #1**

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This paper reports observations of particle size distribution (for particle diameters greater than 1.3 nm) at a coastal site and comparisons are made with similar observations that have been made at a boreal forest site. This is the first time such observations have been reported at a coastal location. Neutral sub-3 nm particles are observed at both locations however concentrations are much lower at the coastal site and are too low to explain particle formation events.

The paper provides useful information that will help to elucidate the new particle formation mechanism and is well suited for publication in ACP. I suggest publication after the following minor comments have been addressed. Additionally, although the paper is

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certainly very understandable, it would benefit in a few places from some minor editing to improve the English.

### **Minor comments**

P26629. Line 21: It is hard to unambiguously assign new particle formation events to natural or anthropogenic sources. I suggest removing the word “Natural”.

P26635, Line 10-11. “Correspond well”: in what sense? It would be good if you could be more quantitative here.

P26635, Line 14-15. How is the clean sector defined? Please give details.

Table 1. The ranges quoted in the paper are very broad. Are these the range of minimum to maximum concentrations that were observed? Please define more clearly. Also I suggest including campaign mean and median concentrations at both sites.

P26637, Line 7. Is this the only explanation for the difference in diurnal cycle and charged fraction? I think it is difficult to unambiguously use this to conclude that the sources and chemical composition of the clusters at the 2 sites are different? Indeed, the next sentence of your conclusion states that the composition is hard to measure and is not known.

Page 26637, Line 12. A relationship between solar radiation and nano-CN has not been well shown. If the authors want to make this conclusion then I would like to see this analysis extended somewhat to demonstrate this more clearly.

P26632, Line 4. Define GAW.

Page 26637, Line. Change “form” to “from”.